

Application No. 10/085,499
Amendment dated June 7, 2004
Reply to Office Action of March 18, 2004

PU010044

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-20. (canceled)

21. (new): A telephony protection device comprising:

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a first stage having a first first-stage input connectable to a tip line of a telephony network, a second first-stage input connectable to a ring line of the telephony network, a first input resistance in series with said first first-stage input and defining a first first-stage output for the tip line, a second input resistance in series with said second first-stage input and defining a second first-stage output for the ring line, a primary spark gap connected between said first first-stage output and said second first-stage output, and first and second secondary spark gaps connected in parallel with said primary spark gap; and

a second stage having a first second-stage input connected to said first first-stage output, a second second-stage input connected to said second first-stage output, a first filter connected between said first second-stage input and a first second-stage output connectable to a telephony device for attenuating a transient voltage developed on the tip line by said primary spark gap, and a second filter connected between said second second-stage input and a second second-stage output connectable to the telephony device for attenuating a transient voltage developed on the ring line by said primary spark gap.

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22. (new): The telephony protection device of claim 21, wherein said first and second input resistances of said first stage comprise fuse-resistors.

23. (new): The telephony protection device of claim 21, wherein said first stage further comprises a first ferrite bead in series with said first input resistance and a second ferrite bead in series with said second input resistance.

a 24. (new): The telephony protection device of claim 21, wherein said first stage further comprises a diode connected between said first first-stage output and said second first-stage output.

25. (new): The telephony protection device of claim 21, wherein said primary spark gap and said first and second secondary spark gaps are connected to ground.

26. (new): The telephony protection device of claim 21, wherein said first filter of said second stage comprises a first inductor in series between said first second-stage input and said first second-stage output and a first capacitor connected between said first second-stage output and ground, and said second filter of said second stage comprises a second inductor in series between said second second-stage input and said second second-stage output and a second capacitor connected between said second second-stage output and ground.

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27. (new): A telephony protection device comprising:

a first stage having a first first-stage input connectable to a tip line of a telephony network, a second first-stage input connectable to a ring line of the telephony network, a first current limiter in series between said first first-stage input and a first first-stage output for the tip line, a second current limiter in series between said second first-stage input and a second first-stage output for the ring line, a primary spark gap connected between said first first-stage output and said second first-stage output, and secondary spark gap circuitry connected in parallel with said primary spark gap; and

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a second stage having a first second-stage input connected to said first first-stage output, a second second-stage input connected to said second first-stage output, first transient voltage filter circuitry connected between said first second-stage input and a first second-stage output connectable to a telephony device, and second transient voltage filter circuitry connected between said second second-stage input and a second second-stage output connectable to the telephony device.

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28. (new): The telephony protection device of claim 27, wherein said first and second current limiters respectively comprise first and second resistors.

29. (new): The telephony protection device of claim 27, wherein said secondary spark gap circuitry comprises series first and second secondary spark gaps.

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30. (new): The telephony protection device of claim 29, wherein said primary spark gap and said first and second secondary spark gaps are connected to ground.

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31. (new): The telephony protection device of claim 27, wherein said first stage further comprises a first ferrite bead in series with said first current limiter and a second ferrite bead in series with said second current limiter.

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32. (new): The telephony protection device of claim 27, wherein said first stage further comprises a diode connected between said first first-stage output and said second first-stage output.

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33. (new): The telephony protection device of claim 27, wherein said first transient voltage filter circuitry of said second stage comprises a first inductor connected in series between said first second-stage input and said first second-stage output and a first capacitor connected between said first second-stage output and ground, and said second transient voltage filter circuitry of said second stage comprises a second inductor in series between said second second-stage input and said second second-stage output and a second capacitor connected between said second second-stage output and ground.

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34. (new): A telephony protection device comprising:

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- a tip line input;
 - a ring line input;
 - a tip line resistor having a first tip line resistor end connected to said tip line input;
 - a ring line resistor having a first ring line resistor end connected to said ring line input;
 - a primary spark gap connected between a second tip line resistor end of said tip line resistor and a second ring line resistor end of said ring line resistor;
 - first and second secondary spark gaps disposed in series with respect to each other and in parallel with respect to said primary spark gap;
 - a tip line filter adapted to attenuate voltage transients developed on the tip line by said primary spark gap and/or said first and second secondary spark gaps, said tip line filter connected between said second tip line resistor end and a tip line output that is connectable to a telephony device; and
 - a ring line filter adapted to attenuate voltage transients developed on the ring line by said primary spark gap and/or said first and second secondary spark gaps, said ring line filter connected between said second ring line resistor end and a ring line output that is connectable to the telephony device.
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35. (new): The telephony device of claim 34, wherein said tip line and said ring line resistors each comprise a fuse-resistor. 22

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36. (new): The telephony protection device of claim 34, further comprising a first ferrite bead connected in series between said second tip line resistor end of said tip line resistor and said tip line filter, and a second ferrite bead connected in series between said second ring line resistor end of said ring line resistor and said ring line filter. 0

a 37. (new): The telephony protection device of claim 34, further comprising a diode connected between said second tip line resistor end of said tip line resistor and said second ring line resistor end of said ring line resistor. 24

38. (new): The telephony protection device of claim 34, wherein said primary spark gap and said first and second secondary spark gaps are connected to ground. 25

39. (new): The telephony protection device of claim 34, wherein said tip line filter comprises a tip line inductor and a tip line capacitor, and said ring line filter comprises a ring line inductor and a ring line capacitor. 26